

SMITHSONIAN ZOOgoer

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MARCH | APRIL | 2011

PANDA possibilities

The zoo is hoping
and working—
for a new giant panda cub.

- » Eggs: Perfect Packages?
- » A Raft of New Reptiles
- » Heaviest Flying Birds



Great day.

Good day.

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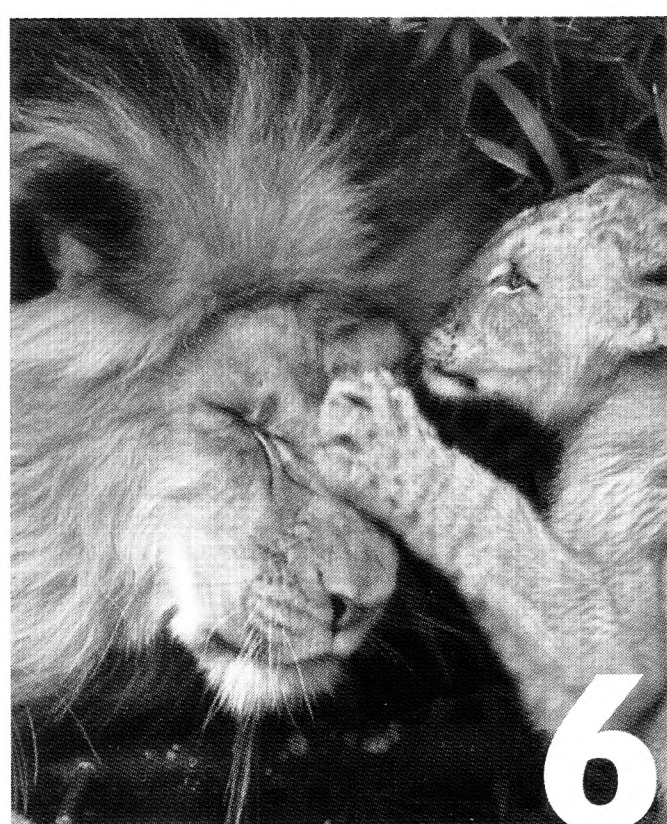


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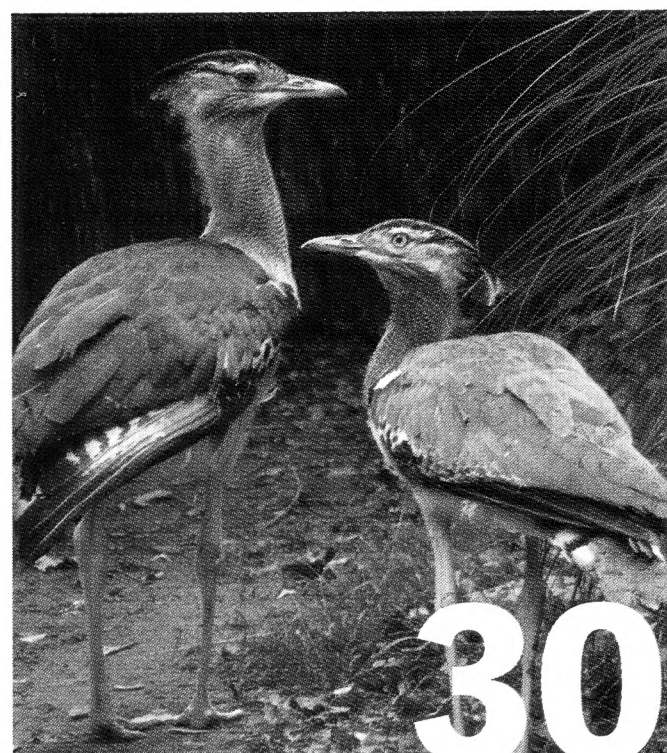
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SMITHSONIAN Zoogoer



is the dedicated partner of the Smithsonian's National Zoological Park. FONZ provides exciting and enriching experiences to connect people with wildlife. Together with the Zoo, FONZ is building a society committed to restoring an endangered natural world. Formed in 1958, FONZ was one of the first conservation organizations in the nation's capital.

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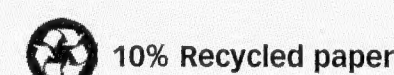
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On the cover: Tian Tian relaxes amid bamboo.
PHOTO BY JESSIE COHEN/NZP

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MORE THAN EVER

“IT IS NOT HALF SO IMPORTANT TO KNOW, AS TO FEEL, WHEN INTRODUCING A YOUNG CHILD TO THE NATURAL WORLD,” said environmental pioneer Rachel Carson. Her words have come back to me a lot during the Zoo’s recent struggle with budgetary issues.

Like other entities which derive the majority of their revenue from the federal government, the Zoo is facing a challenging decline in funding for its staffing and operations. In addition to reducing costs and eliminating some federal positions, the Zoo has announced its plans to close the Kids’ Farm exhibit later this spring or summer.

As the closure decision has become public, I have been gratified by your response. You have written and called to tell us just how much you treasure this wonderful exhibit, a place where so many children and adults for the first time have had the opportunity for an up-close, physical encounter with cows, goats, donkeys, and other farm animals. It is an important exhibit, a place where children can feel, as well as know, the power and wonder of the natural world. We hear you, and we understand the importance of these experiences.

Like you, we’d like to see the Kids’ Farm remain open to the public. The issue is how to do so. As this edition of *Smithsonian Zoogoer* goes to press, we are looking at every option to keep the farm open, but we face a stern budget reality. Operating the farm costs more than \$250,000 a year, and we will need to be able to find the funds both to keep it open and to sustain it.

We can’t promise an easy path through these hard times, nor can we be sure to succeed in finding all of the financial resources needed. But we can promise that FONZ, more than ever, will continue to provide programs, events, and activities that support the Zoo while enabling our members to explore and enjoy it.

We also promise that we will keep you informed as things develop here at the Zoo. In addition to our magazine, we offer a monthly e-newsletter called “Zoo Friends,” and we send out special email alerts for big news. If you’d like to get on our email list, please send a note to fonzmember@si.edu.

Please stick with FONZ and support us. During this time of financial uncertainty, we need your commitment more than ever. Whether you’re joining FONZ for the first time, renewing or upgrading your current membership, giving a gift membership, attending a camp, or attending one of our special events, your dollars support the people and programs that make the Zoo special.

We thank you for your loyalty and generosity. In these challenging days, we count on you more than ever.

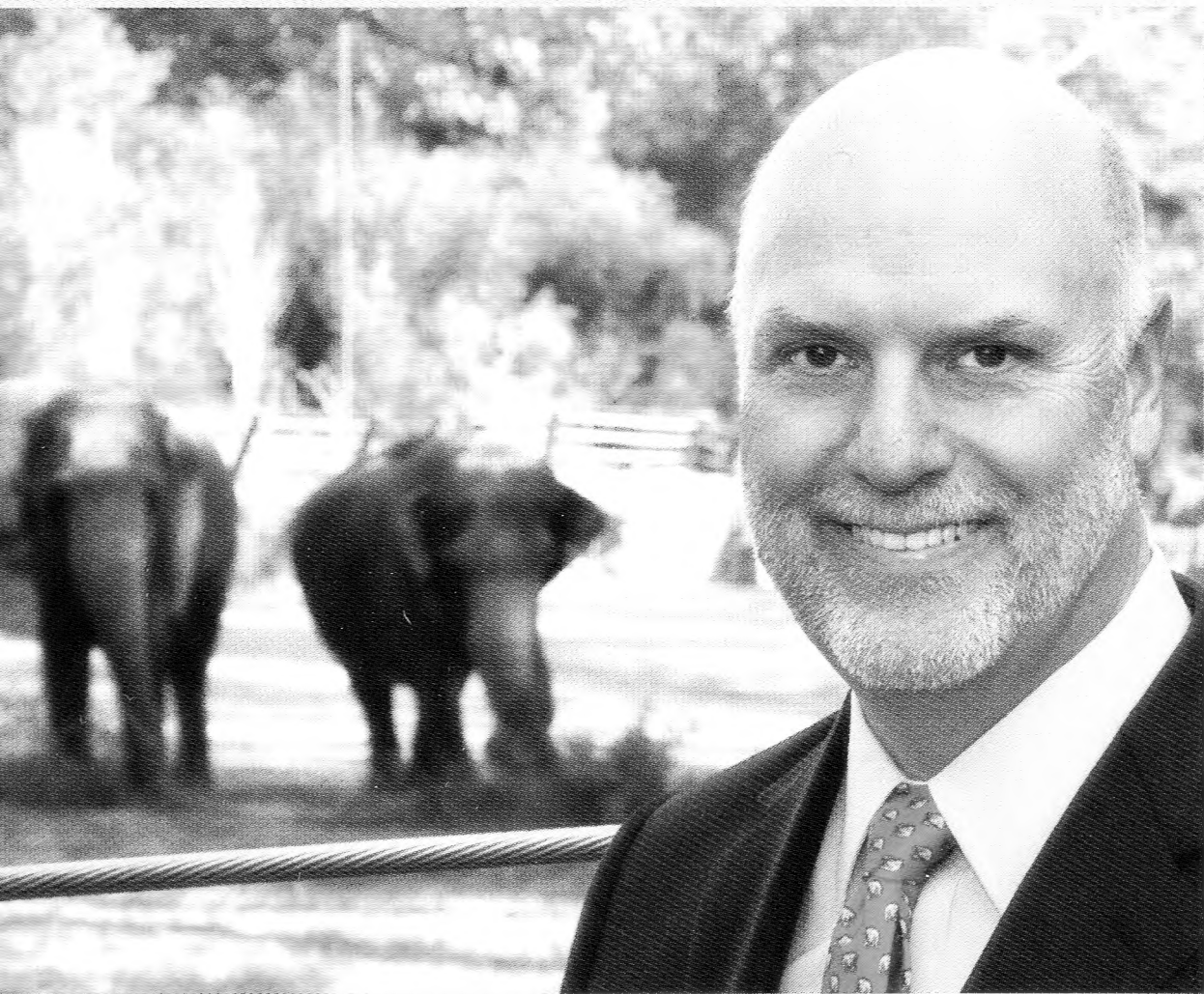
Sincerely,



Bob Lamb
Executive Director, Friends of the National Zoo



MEGHAN MURPHY/NZP



MEGHAN MURPHY/NZP

ON FEBRUARY 14, THE OBAMA ADMINISTRATION SUBMITTED A DRAMATICALLY REDUCED 2012 BUDGET TO CONGRESS.

For the Smithsonian's National Zoological Park, it means reducing the budget by half a million dollars. For the rest of the Smithsonian, it means an additional three million dollars in reductions. This did not come unexpectedly. The nation's fiscal situation is serious, and many voices are advocating for cuts in federal spending.

Faced with the difficult and unavoidable task of identifying how the Zoo budget would be cut, the Zoo's senior leadership made the commitment to do it in such a way so as to ensure the safety and health of the animals in our care, our Zoo staff, and you. A commitment was also made to ensure we continue to offer the best possible visitor experience that every member and visitor has come to expect and appreciate.

With these commitments in mind, my colleagues and I made the decision to close the Kids' Farm. The decision was not an easy one. We concluded that is a necessary one, however, as we endeavor to adapt to our current financial environment and continue to provide excellent animal care, maintain our world-class status as a leader in the field of conservation science, and not jeopardize the Zoo's accreditation with the Association of Zoos and Aquariums.

The animals currently residing in the Kids' Farm are all species that can be relocated easily. They do not necessitate advanced and specialized training as required by the Zoo's other endangered animals. After the closing, my primary concern will be to make sure the animals are placed in homes that meet our stringent standards so they can continue to thrive. At press time, the official closing date had not been determined, but we anticipate the closing to occur sometime during late spring or early summer. Please visit nationalzoo.si.edu to learn more.

I wish I could tell you that the Zoo's sacrifices will end there. They won't. Details will depend on how the national budget battle plays out, and I will make every effort to keep you informed as we move forward.

In these tough economic times, we need our friends more than ever. Thank you for being a Friend of the National Zoo!

Sincerely,

Dennis Kelly
Director, Smithsonian's National Zoological Park

Tiger Training

The Zoo's Smithsonian Conservation Biology Institute

(SCBI) is a key player in the Global Tiger Initiative—a fight to save the estimated 3,200 tigers left in the wild. Last November, SCBI scientists took part in the International Tiger Forum, where 13 tiger-range countries adopted individual Tiger Recovery Programs.

In January, SCBI scientists, working in partnership with the World Bank, led a month-long course on tiger conservation. Set in Thailand, the course taught wildlife officers, field managers, and researchers from tiger-range countries the best ways to increase their wild tiger populations using the latest technology to track the big cats.

MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP

Otters on the Move

Asia Trail has a little less brotherly love at the Asian small-clawed otter exhibit. The six male otters, all brothers, left the National Zoo on March 1. The departure was bittersweet, as it makes room for a new male and female otter to move into the exhibit later this month. Keepers will arrange introductions between the two. If successful, the meetings will give the Zoo a breeding pair.

An Eagle's Death

Sam, a bald eagle, was euthanized on December 31, after she was found lying in her exhibit two days earlier. The eagle was believed to be in her 30s—elderly for a bird that usually only lives into its early 20s in the wild. Sam was found in Alaska in 1986 with a gunshot wound to her wing. The injury prevented her from ever being released back into the wild. Before coming to the Zoo in 2003, Sam lived at the American Eagle Foundation at Dollywood.



JESSIE COHEN/NZP

Lion Update

All ten lions—three adults, seven cubs—have started going outside together.

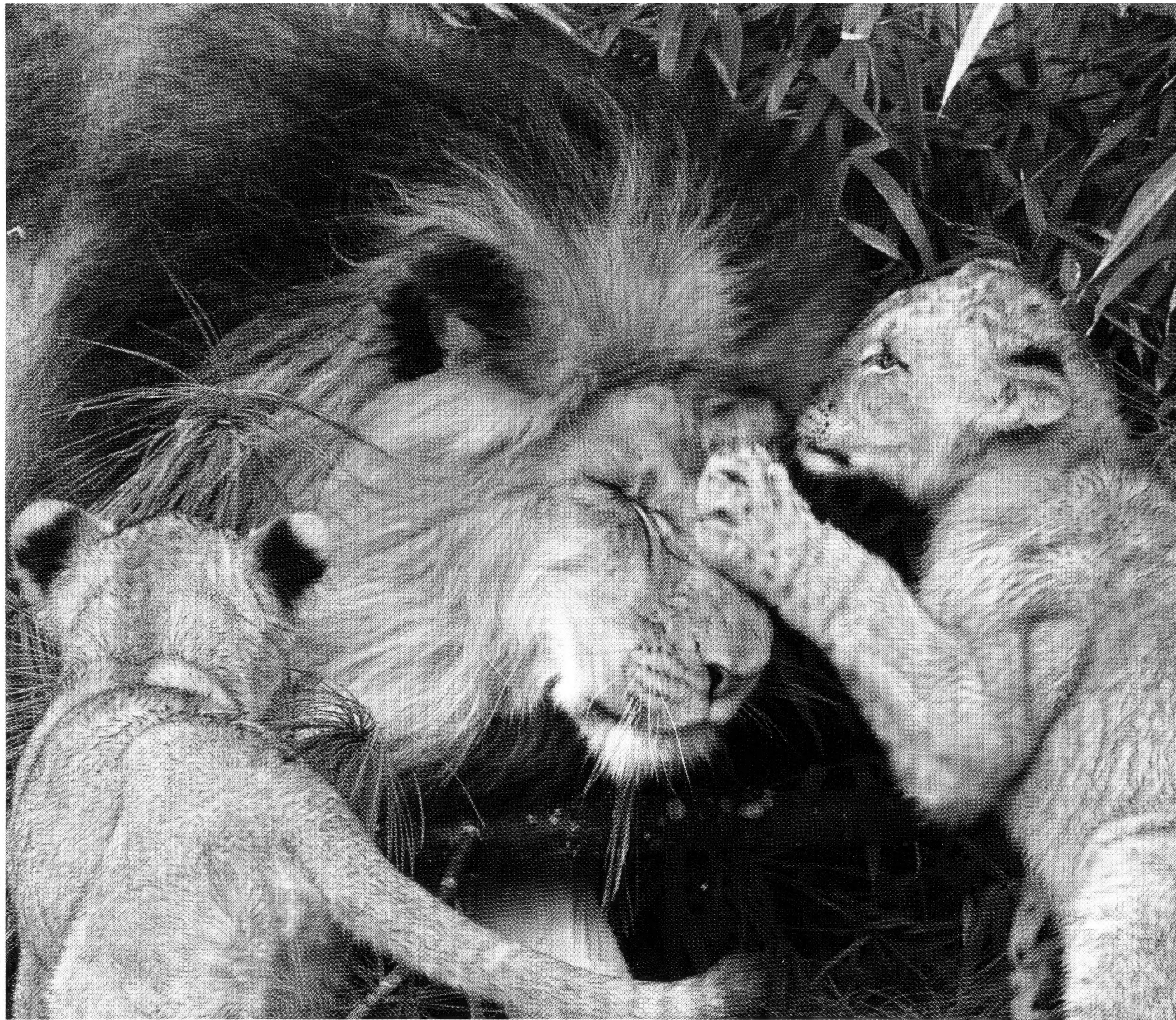
Visitors can see the pride at the Great Cats exhibit every day between 12:30 and 1:30 p.m., weather and behavior permitting.

In mid-January, the cubs began their training. Their first lesson was all about the basics.

Keepers focused on acquainting them with the sound of a whistle, which they will use to get the busy cubs' attention, and teaching them their names.

The cubs received a treat each time they gave the keepers their attention and responded to their names. Subsequent training topics include showing keepers their paws when asked.

MEGHAN MURPHY/NZP



MEGHAN MURPHY/NZP

Anteater Pup

After months of eagerly waiting, the National Zoo welcomed a giant anteater pup. On the evening of December 7, female anteater Maripi gave birth to a male. Keepers monitored the birth via web cam so that Maripi, an experienced mother, would have privacy to bond with her newborn. All seemed well when the keepers finally logged off for the night.

The next morning brought a rude shock. The pup lay on the floor instead of on Maripi's back, where he'd been the night before. He was cold and unresponsive. "The baby was cold, because it was a neonate and was not big and strong enough yet to regulate its body temperature alone. It needed its mother's body heat and the stimulation it would get from her cleaning it," explains keeper Marie Magnuson.

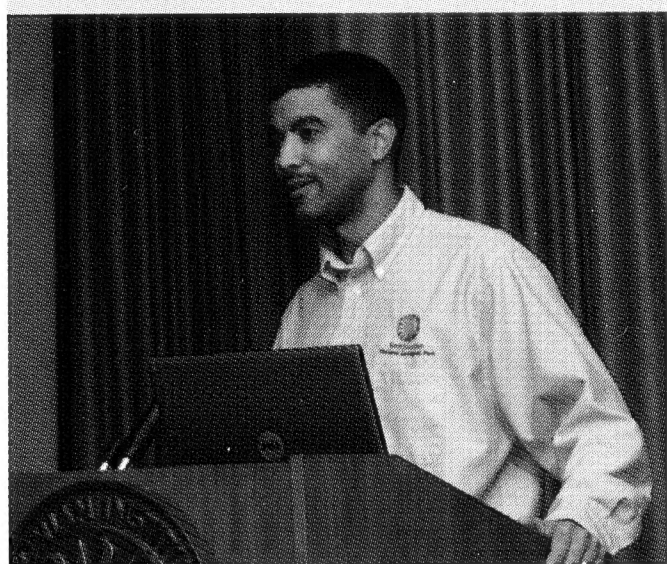
Maripi was also not very responsive. The keepers rushed Maripi and her pup to the veterinary hospital, where they were monitored and the pup's body temperature was gradually raised. "We were anxious to reunite Maripi and her son as quickly as possible," says Magnuson. The longer they were separated, the less likely she would be to accept him back.

By the time Maripi's exam was over, there was an enclosure at the hospital all ready for them. Happily, mother and child rebonded and rebounded. They are now thriving, and visitors can see them on exhibit this spring.

Enchanted Evening

Love was in the air at the National Zoo for Valentine's Day. Great Cats curator Craig Saffoe and cheetah keeper Lacey Braun shared tales of feline romance at Woo at the Zoo on February 11. Saffoe played matchmaker for African lions Luke, Shera, and Naba. His and his colleagues' work was rewarded with the birth of seven cubs last year.

Braun was charged with the task of breeding cheetahs—far harder than it sounds. Female cheetahs suffer from declines in fertility between six and eight years of age; and there is always the possibility that two cheetahs may not be interested in each other. In a race to keep the captive cheetah population stable in North America, Braun's efforts paid off with the birth of two cubs last December.



MEHGAN MURPHY/NZP

Cheetah Cubs

The Zoo's cat population continued its breeding streak in December with the birth of two cheetah cubs at the Smithsonian Conservation Biology Institute headquarters in Front Royal. The cubs were the first cheetahs ever born at the 3,200-acre campus. A male was born to first-time mother Amani on December 6. Ten days later, Zazi, an experienced mom, gave birth to a female.

Amani's cub was pulled for hand-rearing shortly after his birth. Although scientists had observed the cub nursing, a cheetah singleton doesn't stimulate enough milk production in its mother to survive. In the wild female, cheetahs will abandon

singletons in hopes of having another litter with multiple cubs.

"When Amani's cub was 15 days old, having been hand-raised for 13 of those days, we put him in the nest box with Zazi's five-day-old cub," explains lead cheetah keeper Lacey Braun. "We rubbed the two cubs together and put them in the nest box while Zazi was locked outside and busy eating." When Zazi returned to the den, she accepted her new cub and immediately began grooming him. This sort of fostering has only been accomplished successfully five times in North America.

The cubs are now very active exploring their home and using Zazi as a jungle gym. Photos and videos of the cubs are available at nationalzoo.si.edu.



MEHGAN MURPHY/NZP

Are You Smarter Than a Zoo Curator? Think you have what it takes to be a curator at the National Zoo? Then visit nationalzoo.si.edu between now and April 7 and test your zoological knowledge with the new game "Are You Smarter Than a Curator?" Competitors will go head-to-head against enrichment curator Heidi Hellmuth. Each question a player answers correctly will win ten cents for the Zoo's conservation efforts.



JESSIE COHEN/NZP

IN MEMORIAM: Nick Arundel

MEGHAN MURPHY/NZP



Former Friends of the National Zoo president Arthur W. "Nick" Arundel died on February 8 at age 83. His con-

nection to the Zoo and his passion for conservation spanned much of his life.

At nine, Arundel successfully lobbied for the Zoo to add giraffes to its collection through editorials in his self-published *Nicky's News*. The *Washington Post* published several stories on his desperate desire to see the long-necked African animals call the Zoo home. Four giraffes from Sudan arrived at the Zoo only a few months after young Arundel's pleas began.

"Nick Arundel was a legendary FONZ board member whose commitment to wildlife and enthusiasm for sustaining the natural world were apparent to all who met him," says executive director Bob Lamb. "He served as president of FONZ in the mid-sixties, but his contact with and impact on FONZ stretched on for decades. Nick was instrumental in helping the Smithsonian acquire the Zoo's Front Royal, Virginia, property, which now houses the Smithsonian Conservation Biology Institute. His strong support for the Zoo's animal-care, research and education programs will continue to benefit generations to come."

Mark Your Calendar

- Mar. 29 **Snore & Roar Priority Registration**
Members at the contributing level (\$100) or above can register at fonz.org/snoreandroar.htm.
- Apr. 1 **Summer Hours Begin**
Zoo buildings will be open from 10 a.m. to 6 p.m.
- Apr. 5 **Snore & Roar General Registration**
All members can register at fonz.org/snoreandroar.htm.
- Apr. 22 **Earth Day Celebration**
Learn more at fonz.org/earthday.htm.
- Apr. 25 **Easter Monday: Celebrating an African American Family Tradition.** See ad on back cover.
- May 13 **Guppy Gala**
See ad on p. 28.
- May 19 **ZooFari 2011**
See ad on inside back cover.

Zoo Scientists at Work

Scientists from the Zoo's Smithsonian Conservation Biology Institute are taking part in two important efforts to understand biodiversity—and how climate change may affect it.

The Smithsonian Institution Global Earth Observatories is a collaborative project dedicated to studying plots of temperate forests around the world. Scientists hope that their research will help them better understand the wealth of life that forests support, how forests change, and (most important) the role they play in the carbon cycle. Scientists are looking to accurately determine how much carbon temperate forests are capable of inhaling out of the atmosphere. They also want to know when and how much they will exhale.

The National Ecological Observatory Network (NEON) focuses on graphing the causes for changes in biodiversity. NEON scientists study 20 sites around the country. Each site has an instrument tower recording changes in the soil, atmosphere, physiology, and biology of its ecosystem. The data NEON collects will be available through a cyber network.

JESSIE COHEN/NZP



New Cat on Asia Trail

A new fishing cat is making a splash on Asia Trail. Lek, a one-year-old male, is now on exhibit after arriving from the Cincinnati Zoo in December. Keepers hope to breed him with his female neighbor, Electra.

Lek is one of 21 cats in a multi-institutional study that will evaluate how strategies for moving and introducing the cats affect their ability to breed successfully. Understanding all the factors that can affect breeding has become increasingly crucial as fishing cat numbers dwindle in the wild. The cats were recently classified as endangered due to poaching, water pollution, and deforestation of their native habitat along river banks in India and Southeast Asia.

ECOSYSTEM IMPRESARIO

Step into the Zoo's Amazonia exhibit, and you may find yourself forgetting that you're in the middle of a busy capital. The overwhelming density of plants and animals filling two levels of an indoor rainforest is magical. But this exhibit is no illusion. The enchanting setting is the result of constant work by a team of keepers and biologists led by Amazonia curator Vince Rico.

Amazonia is unlike any other exhibit at the Zoo. "It's like managing a little ecosystem," says Rico. "It gives me a one-of-a-kind opportunity to work with animals, plants, and staff that is unique." Managing an ecosystem as effectively as Mother Nature does is quite a balancing act. Rico is responsible for making sure all of the water systems are operating correctly, the animals are healthy, the visitors are happy, the keepers have everything they need, the plants are pruned, and all the life-support systems are functioning. His experience working with and caring for fish and other aquatic animals, as well as birds, made him a perfect fit as Amazonia curator.

Not surprisingly, one of Rico's favorite animals in Amazonia is aquatic—the freshwater stingray. "The uniqueness of the patterns is just amazing," says Rico, "and to be able to see how graceful these animals are as bottom dwellers." The freshwater rays are the first animals to greet visitors as they enter the first floor, which depicts a flooded rainforest.

Rico's second-favorite animal resides in the drier heights of the canopy—the two-toed sloth. "I think the adaptations are just incredible for this animal to survive," he says, "and it's just as cute as can be." The sloth shares her home with primates, birds, frogs, and plants. No mesh or glass separates them from each other or from visitors. "I enjoy that there isn't anything upstairs in the forest that has enclosures," says Rico.

The arrangement seems to suit the animals too. The serene sloth hangs out in her favorite part of the exhibit, at some distance from her livelier neighbors, the dusky titi monkeys. At feeding time, all of the animals eat their food in different areas. "For the birds, we have strategically located food pans throughout the forest where it wouldn't be conducive for the sloths or primates to come to," explains Rico.

"It's actually more of a challenge," he says, "to prune the forest than to maintain the animal collection." The large trees need to be trimmed every six months, and the smaller plants are constantly being pruned.

All the work is worth it, Rico says. From fish swimming beneath one's feet to monkeys cavorting overhead, Amazonia is an extraordinary corner of the Zoo. After all, it's not just anyone who gets to go to work in a whole other ecosystem.

— DEVIN MURPHY



BUILD A HOME FOR SEALS AND SEA LIONS! Rico's aquatic expertise and habit of thinking in terms of ecosystems have made him a valuable member of the team planning a new seals and sea lions habitat. Slated to open in spring 2012, the exhibit will give visitors a multi-sensory experience of the California coast, complete with an artificial tide pool where visitors can literally get their feet wet.

You can contribute to this groundbreaking project at fonz.org/seals.htm.

» In each issue of *Smithsonian Zoogoer*, this "How Do You Zoo?" page will showcase someone who works at the National Zoo. Learn more about careers at the Zoo by visiting the How Do You Zoo? exhibit at the Zoo's Visitor Center. Children ages five to ten can get a hands-on feel for different jobs at the Zoo. The exhibit is open most weekends from 10 a.m. to 4 p.m.



A new agreement with China
keeps giant pandas at the Zoo.

panda PACT

BY PETER WINKLER



Wind chilled the bones but not the spirits of the small crowd gathered at the panda habitat on January 20, 2011. The shivering guests, who included U.S. Secretary of the Interior Ken Salazar, watched intently as two men sat down at a table. Clad in dark suits and crimson ties, they were Dennis Kelly, director of the Smithsonian's National Zoo, and Zang Chunlin, secretary general of the China Wildlife Conservation Association.

Lying before Kelly and Zang on the red-draped table were a pair of black binders, each containing a copy—one in English, one in Chinese—of a new agreement between the two institutions.

Behind the signatories cavorted the true stars of the day—Mei Xiang and Tian Tian, the Zoo's giant pandas. The agreement confirms that the Zoo will likely remain their home for the next five years. (That *likely* is because there's the possibility

JESSIE COHEN/NZP

panda PACT

of exchanging pandas if our cub drought continues.) Any cub born at the Zoo will stay here for the first four years of its life, then head to China. In exchange for all this, the Zoo will contribute funds for conservation efforts in the bears' homeland.

You won't be surprised to learn that plenty of footwork led up to that magic moment at the panda habitat. Kelly and other Zoo officials traveled twice to China to hammer out details of the agreement. Senior scientist Dave Wildt and his col-

Under the terms of the Zoo's agreement with China, scientists have studied these beloved bears both in the wild and in captivity. Based on field research, scientists are fairly certain that "wild pandas live in highly fragmented isolates, many of which do not have sustainable populations."

leagues documented the Zoo's long record of panda science, demonstrating to the U.S. Fish and Wildlife Service (which must approve the importation of any endangered species) that the Zoo's pandas are serious research subjects as well as a popular animal attraction. After all, what Kelly and Zang signed was no mere loan deal. It was a Giant Panda Cooperative Research and Breeding Agreement. Three key words from that title—*cooperative, research, breeding*—describe both the Zoo's panda heritage and its hopes for the future.

Cooperation

Each year for more than a decade now, wildlife biologist Bill McShea has spent two months in China. He ventures far out of the cities, into "the middle of nowhere," to find wild pandas and their neighbors, such as Asiatic black bears and takin.

He doesn't go alone. With him come Chinese wildlife workers eager to polish their skills. "You can't go to school in China for wildlife management," McShea explains, so opportunities for hands-on training are prized. "Our job," he says, "is to say that these are the things wildlife people need to know."

McShea teaches his Chinese colleagues how to conduct censuses and surveys of large mammals, such as the approximately 1,600 giant pandas that live in the wild. His colleague Melissa Songer shows how to use geographic information systems (GIS) and other high-tech tools for tracking wildlife.

"They love it!" McShea says of his students. Ninety percent of them work on Chinese wildlife refuges, so they keenly appreciate anything that helps them become more effective at their jobs. For his part, McShea loves "mentoring people along the way" and knowing that he's "making a real contribution" to wildlife conservation in China.

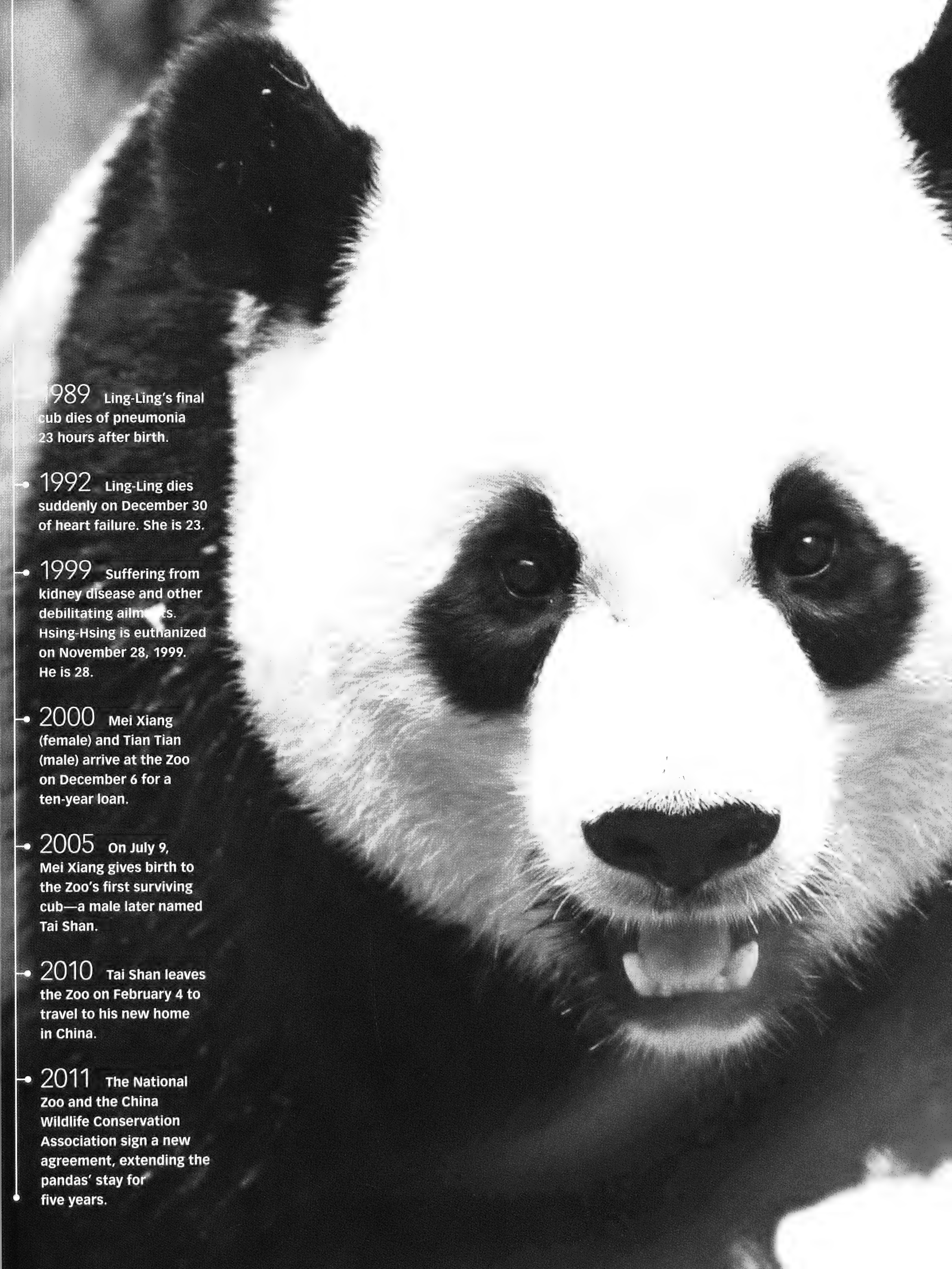
Like McShea, Dave Wildt, who heads the Zoo's Center for Species Survival, has plenty of China stamps on his passport. He coordinates the National Zoo's panda programs, staying on top of happenings as far apart as Washington, D.C., and Wolong, China. "I keep everyone abreast of what's going on," he says.

Wildt's work has given him abundant opportunities to further international cooperation on behalf of pandas. In 1996, he went to China as part of the Conservation Breeding Specialist Group, which explored issues in the captive breeding of pandas—a notoriously difficult challenge. "It was," he says, "a terrific opportunity to get involved with China."

Two years later, Wildt took part in an international team that undertook a biomedical survey of some 60 giant pandas. The group amassed "wonderful research," and Wildt relished the opportunity for "working hand in hand as partners." It's important, he stresses, for American panda experts to resist the temptation to head to China "as

Giant Pandas at the National Zoo

- **1972** Ling-Ling (female) and Hsing-Hsing (male) arrive at the National Zoo. They are a gift from China in honor of President Nixon's historic visit to that nation.
- **1983** After a decade of trial and error, Ling-Ling and Hsing-Hsing mate successfully. On July 21, she gives birth to a male cub. It dies three hours later of pneumonia.
- **1984** Ling-Ling gives birth to a stillborn cub.
- **1987** Ling-Ling bears twins, but neither survives long.



1989 Ling-Ling's final cub dies of pneumonia 23 hours after birth.

1992 Ling-Ling dies suddenly on December 30 of heart failure. She is 23.

1999 Suffering from kidney disease and other debilitating ailments, Hsing-Hsing is euthanized on November 28, 1999. He is 28.

2000 Mei Xiang (female) and Tian Tian (male) arrive at the Zoo on December 6 for a ten-year loan.

2005 On July 9, Mei Xiang gives birth to the Zoo's first surviving cub—a male later named Tai Shan.

2010 Tai Shan leaves the Zoo on February 4 to travel to his new home in China.

2011 The National Zoo and the China Wildlife Conservation Association sign a new agreement, extending the pandas' stay for five years.

panda PACT



MEGAN MURPHY/NZP

ABOVE AND RIGHT: Mei Xiang sits patiently while Zoo staff perform ultrasound examinations.

missionaries.” Indeed, Wildt’s goal is “training ourselves right out of a job” as China’s corps of panda experts grows.

One of those experts recently demonstrated that sharing panda wisdom is a two-way street. Tang Chunxiang is the director of the Bifengxia Base, the panda reserve that is Tai Shan’s new home. “He’s bred more giant pandas,” says Wildt, “than anyone on the planet.” When Mei Xiang went into estrus this past January, Tang flew to D.C. to aid in efforts to mate her with Tian Tian. “We had great, synergistic, collegial discussions,” says senior curator Brandie Smith, whose portfolio now includes the pandas.

Research

The giant panda “is one of the most fascinating species on Earth,” says Wildt. It owes much of its allure to mystery. The uniqueness of the giant panda means puzzles aplenty for scientists. As Wildt notes, “We still have much to learn about panda reproduction.”

One of the top challenges to understanding the wild lives of giant pandas is that they live only in remote, rugged mountains in China. According to a white paper prepared by Zoo scientists, the terrain “makes accurate surveying nearly impossible.” Scientists also know less than they would like about the “type and quality” of panda habitat.



JESSIE COHEN/NZP

All that said, National Zoo scientists have learned a lot about giant pandas in the past decade. Under the terms of the Zoo’s agreement with China, scientists have studied these beloved bears both in the wild and in captivity. Based on field research, scientists are fairly certain that “wild pandas live in highly fragmented isolates, many of which do not have sustainable populations.”

To address that problem, McShea, Wildt, Songer and colleagues have been exploring the possibility of creating “corridors” of forests that link isolated habitats. Such corridors would give giant pandas more options for movement and mate selection. They might also assist with the reintroduction of captive-born pandas into the wild.

Such reintroductions are a distinct possibility, say both McShea and Wildt. There remain good pieces of habitat toward the northern and southern edges of the panda’s range, and the captive population

is burgeoning. Identifying “new landscapes for giant panda reintroduction” is one of the key research goals scientists will pursue under the new agreement.

Scientists and keepers have also studied the giant pandas in their care, amassing a wealth of knowledge that was unimaginable only a few decades ago. They have learned, for instance, vastly improved techniques for maintaining the bears’ health and enriching their lives.

National Zoo scientists, in particular, have become adept at studying the genetic relatedness of captive pandas, and they help their Chinese colleagues maintain an up-to-date studbook of these endangered animals. This helps ensure that breeding recommendations are genetically sound, avoiding inbreeding.

The result of all this gathering and sharing of knowledge is a larger, healthier captive population. In 1998, some 120 giant pandas lived in 19 zoos and breeding centers worldwide. Today, there are 319 captive pandas at 52 institutions around the globe. The captive population, Wildt says, is on the cusp of being self-sustaining.

Breeding

That doesn’t mean, of course, that scientists wouldn’t welcome a tiny, new, pink, genetically appropriate bundle of panda joy. Indeed, senior curator Smith was crystal clear about her main hope for this new agreement: “babies, babies, babies!”

Smith is not alone in her hopes. When Mei Xiang showed signs of estrus this past January, the entire Zoo community kicked into action. Scientist Janine Brown, who runs the Zoo’s endocrinology lab in Front Royal, put things plainly: “We really need to get her pregnant this year.”

That’s easier said than done, as Zoo folk know all too well. Part of the problem is that female giant pandas come into estrus only once a year, for 24 to 72 hours. As Wildt puts it, pandas devote less than one percent of their life spans to reproduction. Once estrus ends, the window of opportunity slams shut for another year.

To avoid any lost opportunities, keepers and scientists work together to monitor Mei Xiang. The former watch carefully for any swelling in her vulva. The latter measure hormones in her urine. They pay special



Born in 2005, Tai Shan is the first male breeding panda cub.

attention to estrogen, watching daily or even hourly as it rises over the course of a week and then falls back to baseline levels. Once Mei Xiang's estrogen level has returned to normal, she is at her most fertile.

And then what? First, keepers give Mei Xiang and Tian Tian a chance to do what comes naturally. They carefully arrange an introduction between the two bears. "Every year," says Brown, "Tian Tian gets a little closer to getting it right." But he's never managed to actually inseminate Mei Xiang. At that point, nature gives way to science, and reproductive experts inseminate Mei artificially.

Then comes the waiting. Panda infants are tiny, so expectant mothers don't show the way some other animals do. Pandas, moreover, are prone to a phenomenon called pseudopregnancy. Females will engage in maternal behaviors such as nest-building, and their progesterone levels will rise. Yet they never give birth. Perhaps the

embryo died and was reabsorbed into the mother's body; perhaps it never existed. Scientists are still teasing out the nuances of this baffling behavior.

At the Zoo, the waiting comes with much wondering. Why, everyone wants to figure out, has Mei Xiang not produced a cub since Tai Shan's birth in 2005? Brown checks off the possibilities: "The artificial inseminations have been perfect. The hormone levels are right. The semen is good. It's a mystery."

One possible clue to the mystery is that Mei Xiang has been coming into estrus earlier in the year than before. She used to show signs of fertility in March; now she's ready in January. Brown is not sure why Mei's cycle has shifted, nor what its implications are for her ability to reproduce.

Panda Possibilities

Chill winds still blow through the panda habitat. They don't bother the cold-loving

bears, nor do they deter hardy admirers. Before long, though, those icy shafts will give way to spring breezes laden with warmth and humidity and hope.

By then, the memory of the agreement signing will be faint. But the agreement's importance will be no less profound. Cooperation will still thrive, as Chinese and Americans work together to study and protect these endangered icons. Research will continue to peer into the shadows of their little-known lives.

And breeding? No quick answer there, alas. Giant panda gestation can take three to six months. By then, the city's famed cherry blossoms may have come and gone. Washingtonians will be planning summer vacations. And the Zoo's panda team will wait impatiently to learn if their efforts to nudge nature have born fruit. **SZ**

— PETER WINKLER is the editor of Smithsonian Zoogoer.



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ReptileRoundup

BY VALERIE MAY

If the Smithsonian’s National Zoo stationed a barker outside the Reptile Discovery Center (RDC) these days, that’s what you might hear. The tone may be a bit frenzied, but there’s ample reason for excitement. The RDC team is shaking things up, bringing in more than a dozen new species.

“We are looking for animals that would intrigue a visitor,” says curator Jim Murphy. “This was a pretty static collection for a long time. We are also looking for animals that are endangered or part of a special breeding program. And animals that might lead to some interesting research.”

Biologist Matt Evans describes the new approach as “a shifting in the nature of the story we want to tell here. We are highlighting endangered species. Most of the new animals we are bringing in are threatened in some way. Some



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MI HOAN MURPHY/N/P



are on the brink of extinction. To make room for them, in 2010 we shipped out dozens of non-endangered animals—over ten species—to other zoos.”

The RDC team hopes that this sharper focus on endangered species will inspire visitors toward a greater ethic of wildlife stewardship. They also hope to imbue a younger generation with a passion for these often overlooked animals.

Complex Choreography

The exodus set off a blizzard of paperwork and procedures. Zoo officials ensured that each departing animal had the necessary documentation. Then animal-care staff and transport experts figured out the best way to move creatures to their new homes.

Participants in the mass departure included a northern pine snake, two Brazilian rainbow boas, two Everglades rat snakes, and two green tree pythons—all of which went to the Big Apple’s Staten Island Zoo. Eight leopard tortoises went to Maryland’s Catoctin Wildlife Preserve and Zoo; a bearded dragon to Zoo Atlanta; three veiled chameleons to Colorado’s Pueblo Zoo; an Asian water dragon to the Cincinnati Zoo; and five leopard geckos to Bramble Park Zoo in South Dakota.

The RDC team then prepared new exhibit spaces for its influx of endangered animals. Nine species arrived last year. Beyond those already mentioned, the list includes the fantastic leaf-tailed gecko from South Carolina’s Riverbanks Zoo as well as two Timor pythons, three green tree monitors, four Hamilton’s Pond turtles, and three spectacular spider tortoises from the Wildlife Conservation Society’s Bronx Zoo and the San Diego Zoo.

In 2011, keepers plan to introduce four more species to the show. Visitors will meet a native of Southeast Asia, the highly endangered impressed tortoise. A pair of captive-bred youngsters is being donated by

DID YOU KNOW ?

Several long-time residents of the Zoo’s Reptile Discovery Center have outlived their expected life spans. These include a Gila monster, Brazilian rainbow boa, and chameleon. Curator Jim Murphy credits “the excellent care they receive from their keepers.”

FACING PAGE: **Fantastic leaf-tailed gecko**
TOP LEFT: **Green tree monitor**
TOP RIGHT: **Solomon Island skink**

the Turtle Survival Alliance, a well-respected conservation group based in Georgia.

Georgian arrivals will also include four juvenile spiny-headed tree frogs from the Atlanta Botanical Gardens. The RDC team also hopes to obtain the vividly named snot otter, a salamander species also known as the hellbender.

The only non-threatened animals that are joining the collection are two black-headed pythons. “We’re getting them because they are beautiful and amazingly cool,” says Murphy. “They are just gorgeous and we all like them.”

Living Gifts

One interesting aspect of all these animal exchanges is that no money changed hands. “All the animals we received are gifts, and everything we send out is a gift,” says Murphy. Zoos, he explains, have been moving away from buying or selling animals.

That shift is partly a reaction to one of the principal threats to their survival—the lucrative illegal trade in rare and threatened animals. One example is the going black-market price for the

The Reptile Discovery Center team hopes that its sharper focus on endangered species will inspire a greater sense of wildlife stewardship.

highly endangered radiated tortoise, a popular RDC citizen. Considered one of the world's most beautiful tortoises, this exquisite creature displays a striking star pattern on its carapace. Brilliant yellow lines radiate from the center of each dark plate of its shell.

Radiated tortoises are one of four tortoise varieties on the island of Madagascar. All four are at the edge of extinction. Hunger for their meat (a source of protein in a poor country), loss of habitat, and overexploitation in the pet trade are contributing to their disappearance. Despite laws protecting the species, traffic continues, and the *Washington Post* recently reported that one collector paid \$30,000 for a wild-caught radiated tortoise in what the article described as a "market-driven extinction vortex."

The phrase *wild-caught* deserves attention. Another attribute of a modern zoo's reptile collection is its reliance on captive-bred animals. Few if any specimens come

from the wild. Many species are endangered and legally cannot be removed from their habitat. So conservation-minded herpetologists work hard to create sustainable captive-bred populations.

Species Survival Plans

Much of this work happens under the auspices of the Association of Zoos and Aquariums (AZA), which administers three types of population-management program. The goal of these programs is to preserve some of the biodiversity that is being destroyed in the wild at breakneck speed as overpopulation, climate change, invasive species, and overexploitation take their toll. RDC has 18 species enrolled in some form of AZA plan. Seven of them take part in the most rigorous type of program—Species Survival Plan (SSPs).

"Any kind of breeding program requires certain numbers to maintain a sustainable population," Murphy explains. "You need to avoid inbreeding and serious genetic

flaws. So you determine the most unrelated animals within a species—you spread out as much as possible the relatedness—breeding animals as unrelated as possible. And you hope to create a sustainable colony."

That is what the AZA does as a routine part of its breeding programs. For SSPs, maintain a studbook much like that of pedigreed dogs or the ancestral lines of racing horses. A zoo participating in an SSP must be prepared to send and receive animals for breeding purposes as requested by the AZA. The plan seeks to ensure the sustainability of a healthy, genetically diverse, and demographically varied population. On the zoo's part, this requires a major commitment in time and resources. Murphy describes participation in an SSP as "the ultimate commitment for a zoo."

A great challenge for both the AZA and participating zoos is determining the number of SSPs that can be maintained in the face of resource limitations. The fact is that zoos have the ability to deal with only a fraction of the animals at risk. Furthermore, the AZA offers SSPs for only a selection of endangered species.

Take, for example, amphibians, which are facing a crisis. "Of the 6,000 amphibian species, a third to a half are threatened with extinction," says Evans. "Yet only three species are managed by an SSP because there are just not the resources needed."

Golden Opportunity

For the RDC, the reality is that there isn't space to take on all that needs to be done. "There is this constant disconnect because we can't do everything. What do we focus on? Where do we put our resources?" says Murphy.

"The turtle guys want us to concentrate on turtles; the snake guys on snakes; the frog fellows on frogs." He adds, "With the reptiles and amphibians, what we are watching is such an extraordinary thing in terms of loss of biodiversity. People are paralyzed. They don't know what to do."

"We need to limit expectations to doable goals," Murphy continues. "We cannot save the world's biodiversity. We may be able to save a few species, but our guys—reptiles and amphibians—get lost in the shuffle when compared with the charismatic megafauna."

The Sixth Extinction?

Five times in Earth's history, scientists believe, natural catastrophes wiped out large numbers of species in a short period of time.

The most recent extinction, about 65 million years ago, finished off the dinosaurs.

Today, species are again dying off quickly, due primarily to habitat loss and overexploitation by humans.

Harvard scientist E.O. Wilson estimated

that some 30,000 species perish each year. That's about three an hour.

"So many animals are severely endangered," says Reptile Discovery Center curator Jim Murphy, "that some refer to it as the sixth extinction." He adds, "Some of my herpetological colleagues are now calling themselves 'extinction biologists' or 'forensic taxonomists.'" When asked if he thinks of himself in those terms, Murphy responds, "I'm getting there."

Facing the reality that zoos can work with only a fraction of the animals at risk means keepers and curators carefully evaluate where to pack their punch. Meticulous thought and planning resulted in the new cast of characters coming to the RDC. Most of the animals are young, and keepers hope to breed them in the coming years. The RDC currently participates in SSPs for the Panamanian golden frog, Chinese alligator, Cuban crocodile, Komodo dragon, Malagasy leaf-tailed gecko, Fiji Island banded iguana, and radiated tortoise.

One of those SSPs—for the Panamanian golden frog—testifies to the importance of never giving up hope. Some scientists think this colorful animal went extinct in the wild in 2007. Others think it's holding on—

barely. The Zoo received eight pairs of these critters in December 2004 and successfully created a captive colony.

Between 2006 and 2010, 102 offspring took up residence in ten other zoos, and the RDC plans on providing zoos with another 80 frogs via captive breeding this year at the recommendation of the SSP. Some day, these animals—or their descendants—may be reintroduced into the wild.

Scientists hope to tell similar stories about other imperiled species. Perhaps some of the RDC's young visitors, inspired by the new cast of characters, will bring such hopeful stories to life. **SZ**

—Frequent contributor VALERIE MAY is a freelance writer and web producer.

Reptile Discovery Center animal keeper Janis Gerrits holds a Fiji Island iguana, seen in greater detail below.



MEHGAN MURPHY/NZP



Cracking the

The egg reigns supreme as the animal kingdom's preferred reproductive method.

BY DEVIN MURPHY

Life begins with an egg.

Most mammals, reptiles, amphibians, invertebrates, and birds at the Smithsonian's National Zoo started out as nothing more or less than a fertilized egg. Some of those eggs transformed within their mothers' wombs into cuddly cubs or precious pups. But most did not.



Cracking the Egg

In many species, young grow outside their mother's body. The encapsulating egg protects the growing embryo while providing it with nutritious yolk, water, oxygen, and room to grow.

Selecting the Sex

Eggs are such a fantastic life support system that it almost seems foolish to hatch. The Labord's chameleon would agree. It lives only about 12 months and spends eight or nine of them in its egg, protected from Madagascar's oppressive dry season.

Such a short life span is atypical among reptiles, some of which live for a century. Cuban crocodiles can live for 75 years, spending only 86 days in their eggs.

Crocodilian eggs do not act as shields from the environment to the extent that Labord's chameleon eggs do. A crocodile egg actually needs direction from its environment. The temperature of the nest activates the sex chromosomes of a developing crocodile in its egg. Temperature-dependent sex determination, as this process is called, is not left up to chance, however. Female crocodiles are keenly sensitive to soil temperature as they build nests for their 30 to 40 eggs.

To hatch males, Cuban crocodile mothers need to keep their nests between 30° and 30.5° Celsius. Any higher or lower, and the nest will yield females. But hatching a generation of all male or female

crocodiles is not a recipe for evolutionary success. To prevent a generational disaster, different parts of the nest will hatch different sexes.

"Eggs that are closer to the surface may not be at the same temperature as eggs in the center or bottom of the nest," says Barbara Watkins, a keeper at the Reptile Discovery Center (RDC). "Another factor is that females have been observed urinating on the nest. Some think this encourages bacterial decomposition. That may affect the temperature."

Because the Zoo is a captive setting, it is a little easier to hatch a desired sex. After a female crocodile lays a clutch of eggs, keepers remove them from the nest and place them into prepared and meticulously monitored incubators, which are kept at the perfect temperature for males or females. RDC curator Jim Murphy explains that keepers "almost always" move eggs to incubators, "because it gives us more control."

The window for moving eggs into an incubator is short. "I would say we have 24 to 48 hours after the eggs are laid to have them at the correct temperature," says Watkins. Once the eggs are safely placed in an incubator, keepers will not touch them again until they hatch. "The embryo will attach itself to the egg within 24 hours of being laid," Watkins explains. "Movement of the egg may result in the death of the embryo."

The Zoo is planning, at some point down the road, to hatch four Cuban crocodiles to bolster the captive population in North America as the wild populating dwindles.

The iPhones of Eggs

Reptiles are seasoned egg-layers (crocodiles are relics from the Jurassic era), but they have competition from the air. "Reptiles are kind of like the Apple II computer, and birds are like the iPhone," says bird curator Dan Boritt. That's not to say that birds are total newcomers to the egg-laying game. "People will argue both ways on evolution



MEHGAN MURPHY/NZP



MEHGAN MURPHY/NZP

PREVIOUS PAGE: Cuban crocodile
TOP: A Cuban crocodile lays a clutch of eggs at the Zoo.
BOTTOM: Keeper Barbara Watkins and retired curator Michael Davenport collect Cuban crocodile eggs.



JESSIE COHEN/NZP



MEGHAN MURPHY/NZP



MEGHAN MURPHY/NZP

(TOP LEFT: Brown kiwi egg
(BOTTOM LEFT: Kiwi chick Koa, a male, hatched
in 2008.
ABOVE: Keeper Kathy Brader holds Hiri,
a female kiwi who hatched in 2010.

and where birds came from. My take is birds are direct descendents of reptiles and dinosaurs. Most dinosaurs were egg-laying, but there has been quite a bit of change in the way birds incubate.”

Birds exclusively lay eggs; not a single species gives birth to live young. That’s because most birds rely on flight as their main defense against predators. “Birds have to be mobile,” says Boritt, and they can’t afford the extra weight of a developing embryo. Most birds lay eggs within two days of fertilization.

Of the more than 100 species of birds at the Zoo, the brown kiwi breaks all the

rules. “Everything about them is just different,” says keeper Kathy Brader. Native to New Zealand, this endangered, flightless bird lays an egg that weighs about 20 percent of her own weight. The egg is so large, it fills her entire abdominal cavity. Such a huge egg means that there is little room for any metabolic activity. So the female stops eating a few days before she lays her egg.

“A lot of people will tell you, myself included, that the most strenuous thing a bird will ever do is hatch from an egg,” says Boritt. “A lot of birds will die in the hatching process.” Most birds and reptiles have an egg tooth: a calcification on their beaks or

snouts. It is specially designed to help them break out of their egg. Kiwis lack an egg tooth. They kick their way out. Hatchlings begin foraging within a few days. Even though they are capable of taking care of themselves, they may still stay in their parents’ territory for up to six months.

Big Birds, Big Eggs

Kiwis are not the only birds with big eggs. The Zoo is also home to kori bustards, the largest birds that can fly. In the wild, these threatened birds live in southern and eastern Africa. Females lay eggs only during the wet season, because chicks need an

Cracking the Egg

RIGHT: Biologist Sara Hallager measures the temperature of a kori bustard egg.
BELOW: The Zoo hatched strawberry dart frogs for the first time in its history in 2010.



MEGHAN MURPHY/NZP



JESSIE COHEN/NZP



MEGHAN MURPHY/NZP

LEFT: Solomon Island leaf frogs skip the tadpole stage, hatching as froglets.

abundance of insects to flourish. When the rains finally arrive, several females mate with a single male. Then each female lays two 150-gram eggs right on the ground—no nest required.

“The eggs are green,” explains biologist Sara Hallager. “They kind of look like something out of the army because they’re camouflage.” Their color helps them blend

in with the ground and rocks that surround them, so they are safe when their mother leaves them to get food.

Kori bustard eggs hatch 23 days after being laid. “For a bird that size, it’s very short,” Hallager points out. But after they hatch, there is no rush to grow up and fly away from home. “They stay with mom for almost the first full year,” says Hallager.

At the Zoo, keepers pull kori bustard eggs for hand-rearing. The female birds receive dummy eggs, which they continue to faithfully incubate. Because kori bustards are so skittish and wary of humans, it is easier to hand-rear them in captivity so they are less shy as mature birds. The Zoo has raised 55 chicks since 1997 and was one of the first zoos to raise koris.

Kori bustard eggs are placed in incubators and need to be turned every two hours. Two days before the egg hatches, it will begin to turn itself. After a chick hatches, it no longer has a use for the shell, which lies cracked into pieces, but keepers still do. “When a chick hatches, there are a lot of residual blood veins. You can actually take the egg shell and send it into a lab, and they can sex the chick from the DNA,” says Hallager.

Different Parenting Styles

Like reptiles and birds, amphibians lay eggs. But they don’t stop there. Amphibians coat their eggs with a transparent jelly. The substance protects the eggs and also traps heat,

regulating the temperature of the young amphibians until they are capable of doing so. Being semi-permeable, the jelly also helps hydrate the developing animals.

Frogs can lay hundreds of eggs in a single clutch. The American bullfrog does so, counting on sheer volume to ensure the survival of at least some of its offspring. “That’s a perfectly good way of making new frogs and standard in the temperate part of the world,” says biologist Edwin Smith. But “when you get down to the tropics, wow! How everything changes.”

The strawberry poison dart frog, native to Central and South America, invests in hard work rather than large clutch sizes. Females lay only six or seven eggs, bunched together in a clear jelly, on a sheltered leaf on the forest floor. The male waters the clutch by emptying his bladder on it. Meanwhile, the female patiently waits about eight days for the embryos to grow into tadpoles. Each is the size of a grain of rice.

When a tadpole hatches, the mother frog places it on her back. She then climbs into the upper level of the rainforest to find a small pool of water nestled in the leaves of a bromeliad. She leaves the tadpole there. The mother repeats the trek for each tadpole.

For the next 80 days, the mother returns regularly to feed the tadpoles. On each visit, she lays an unfertilized egg—nutritious food that helps the tadpole survive metamorphosis.

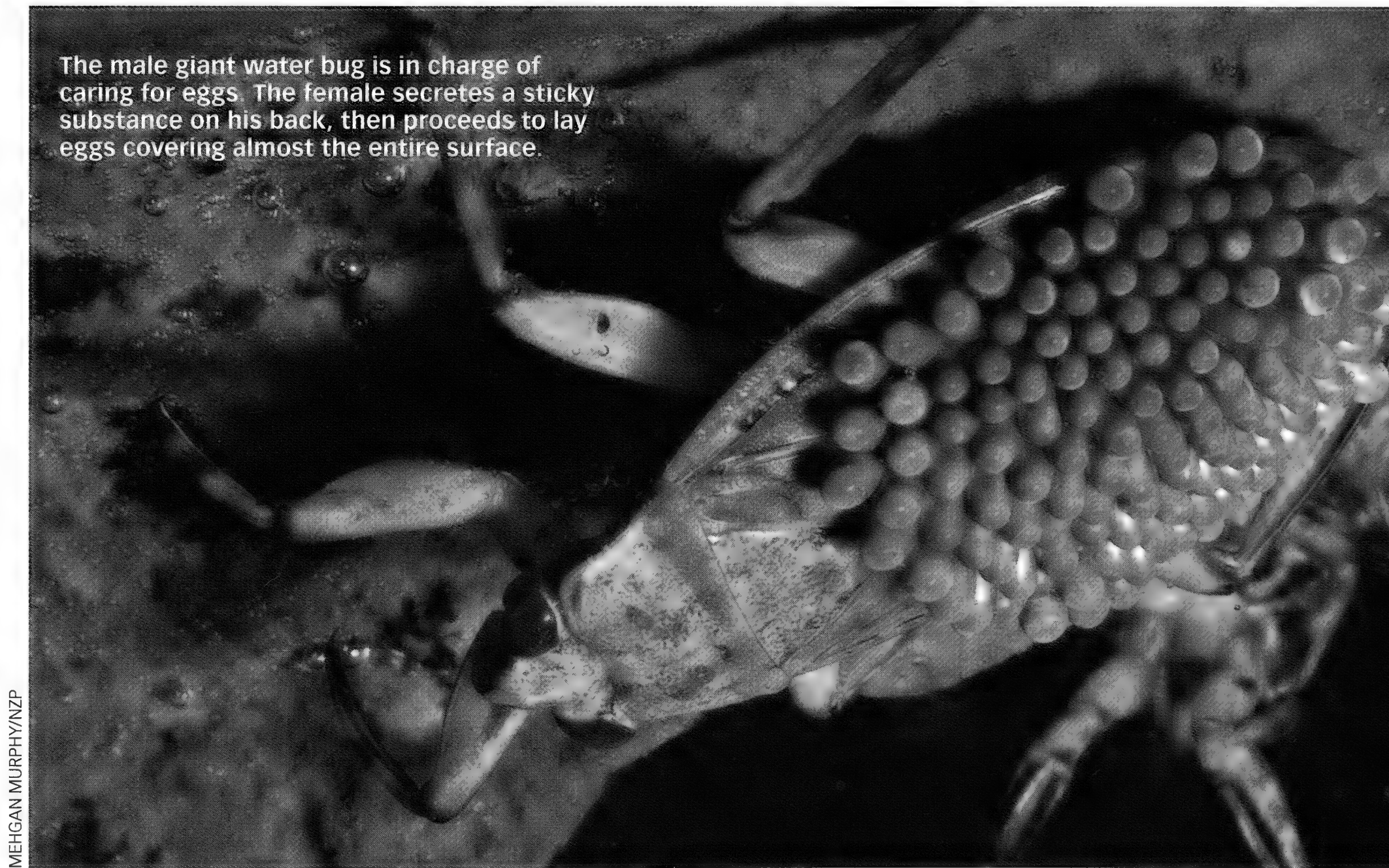
Last year, the Zoo bred strawberry dart frogs for the first time in its history. Keepers customarily raise eggs and tadpoles away from their parents, but they cannot do that with strawberry dart frogs. “It’s not really that difficult; you just have to have the right environment for it,” says Amazonia keeper Justin Graves. “The female strawberry dart frogs have to feed the juvenile tadpoles unfertilized eggs.”

The frogs’ terrarium includes bromeliads that can serve as tadpole nurseries. They are about three feet up from the bottom—a long way for a frog that is smaller than a quarter.

Hordes and Hitchhikers

Add all those egg-laying reptiles, birds, and amphibians together, and you’d still come nowhere near the number of the

The male giant water bug is in charge of caring for eggs. The female secretes a sticky substance on his back, then proceeds to lay eggs covering almost the entire surface.



MEGHAN MURPHY/NZP

largest group of egg layers—invertebrates. These spineless creatures account for 99 percent of the animal kingdom.

One of the Zoo’s most popular invertebrates, the giant Pacific octopus, puts all its eggs in one basket, proverbially speaking. For females, breeding is literally a once-in-a-lifetime experience. They find a cave or crevice that can serve as a den. There, they lay more than 80,000 eggs in strands that resemble miniature grape stems.

Tending the clutch is a labor of love. The female fastidiously bathes the eggs with oxygenated water, which she squirts over them with her siphon. This intense work keeps the octopus too busy for food. “Octopuses may live only two months to six months after that because they’re not eating,” says invertebrates curator Alan Peters.

When the octopuses hatch two months later, they are no bigger than a pinkie fingernail. Translucent, they have two red eyes. Their tentacles are nothing more than little stubs, and their mantles make up the bulk of their miniscule bodies. “They’re really small, and they often get eaten,” says Peters. Only a lucky few get the chance to live up to their “giant” name.

These octopuses share that adjective with another resident of the Zoo’s Invertebrate Exhibit. Giant water bugs can grow an inch and a half long, not too shabby for a bug. Females have a surefire way of

ensuring paternal care for their eggs: They lay them on the father’s back! “It’s his responsibility to hatch the eggs,” says keeper Donna Stockton.

The female attaches the eggs to the male’s back by secreting a glue-like substance that holds them in place. She then carpets the male’s back with eggs. “They fill his whole back,” says Stockton. “That can be anywhere from 20 to 100 eggs.”

When the larvae are ready to hatch, the father swims to the surface of the water so that his offspring can breathe. (Though aquatic, giant water bugs breathe air.) The newly hatched larvae are no bigger than M&M candies. They are white for an hour or two before their exoskeletons harden. At the Zoo, Stockton separates the newly hatched larvae quickly to prevent them from eating each other.

Practically Perfect

Obviously, some species, notably ours, reproduce successfully without laying eggs. And eggs are far from foolproof. Predators eat them, some fail to hatch, and many young don’t make it to adulthood. Still there’s no denying that, for animal offspring of countless species, shapes, and sizes, eggs make nearly perfect packages. **SZ**

— DEVIN MURPHY *is the editorial intern for Smithsonian Zoogoer.*

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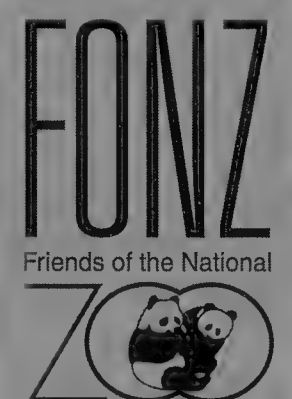
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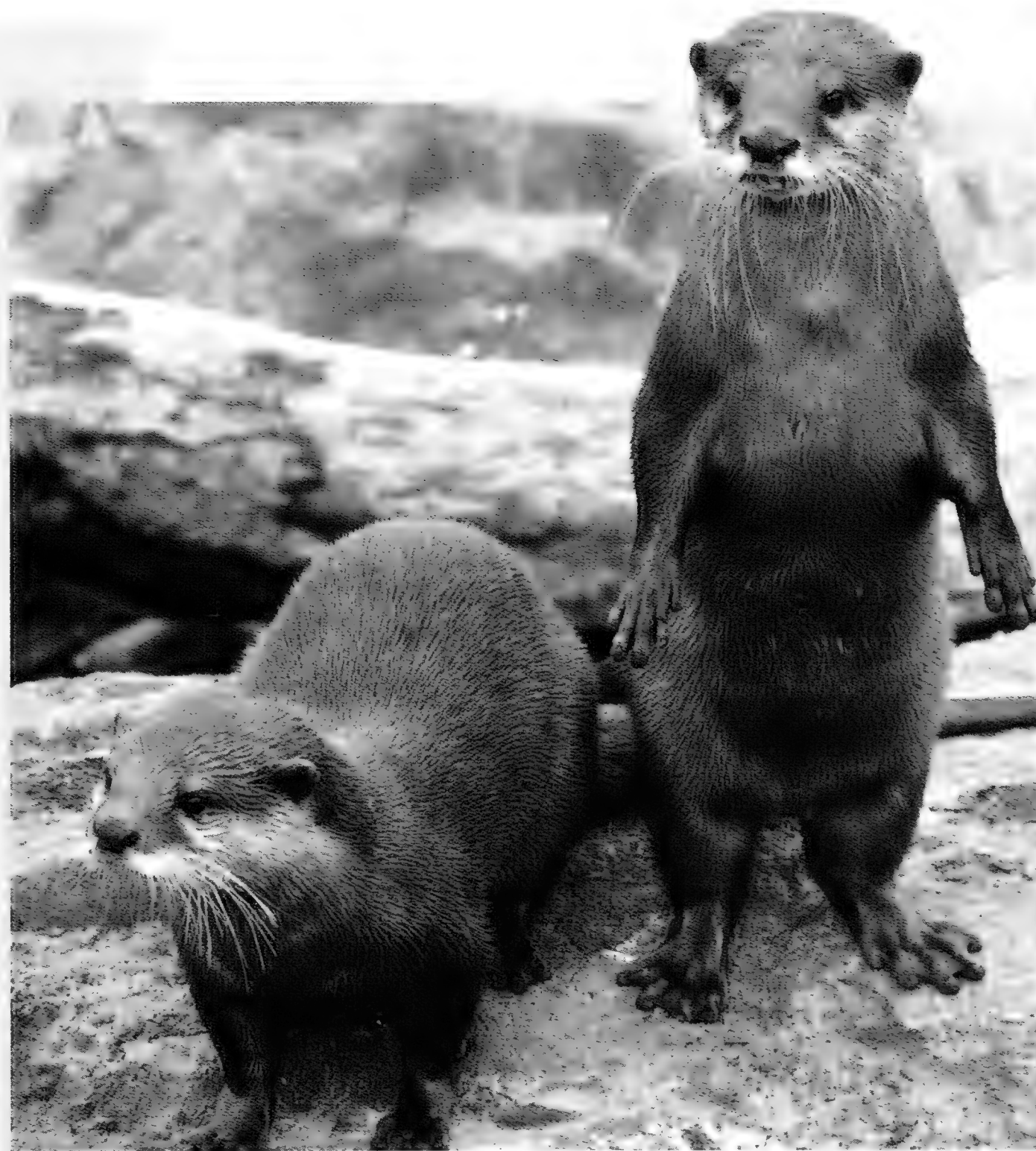
SUPERLATIVE Smallest Otter Species

The Asian small-clawed otter is the smallest of the 13 species of otters. Each of these agile, aquatic mammals is 16 to 25 inches long and weighs about 6 to 12 pounds. The giant otter, in contrast, can weigh more than 50 pounds.

Asian small-clawed otters live in family groups comprising a breeding pair and its offspring. Families usually have about a dozen members. They work together to raise offspring, which are born blind and depend on relatives' help for everything in their first 40 days of life.

Rearing a family and keeping it safe requires excellent communications skills. Asian small-clawed otters use at least 12 calls to stay in touch with one another.

You can visit Asian small-clawed otters on Asia Trail.



JURGEN FREUND/NPL



DID YOU KNOW?

Hermit Hitchhikers

The hermit anemone is not the solitary sea dweller

its name conveys. This type of anemone needs a partner to survive. Its quest to find the perfect location with lots of food and its lack of mobility forces it to piggyback aboard another sea creature—the hermit crab.

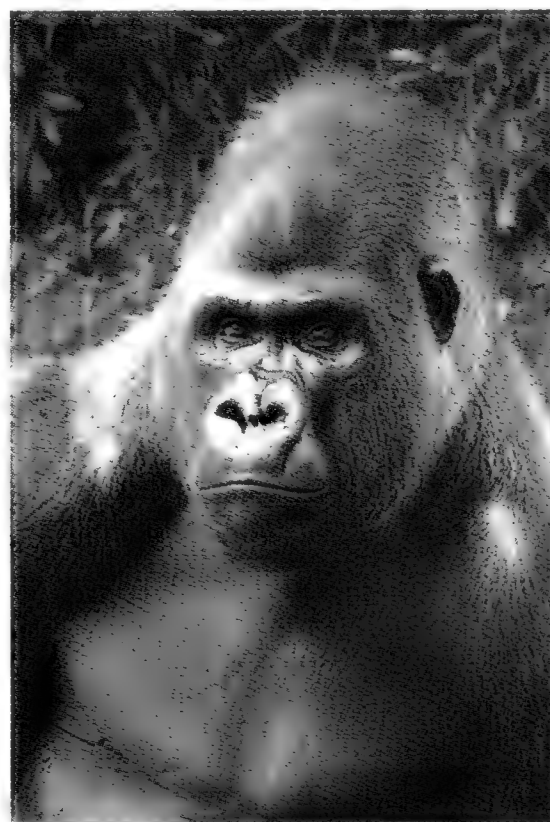
When a hermit crab crawls across its path, the anemone hitches a ride. It attaches itself to the shell of the crab, disembarking only when the crab comes to a promising location. As an added bonus during the trip, the anemone can also gobble up any stray morsels from the crab's meals.

FACT OR FICTION?

A Tortoise Can Outweigh a Gorilla



MEGHAN MURPHY/NZP



MEGHAN MURPHY/NZP

FACT. The male Aldabra tortoises on exhibit at the Reptile Discovery Center weigh more than 500 pounds apiece. Compared with them, the Zoo's silverback gorilla, 375-pound Baraka, seems downright puny.

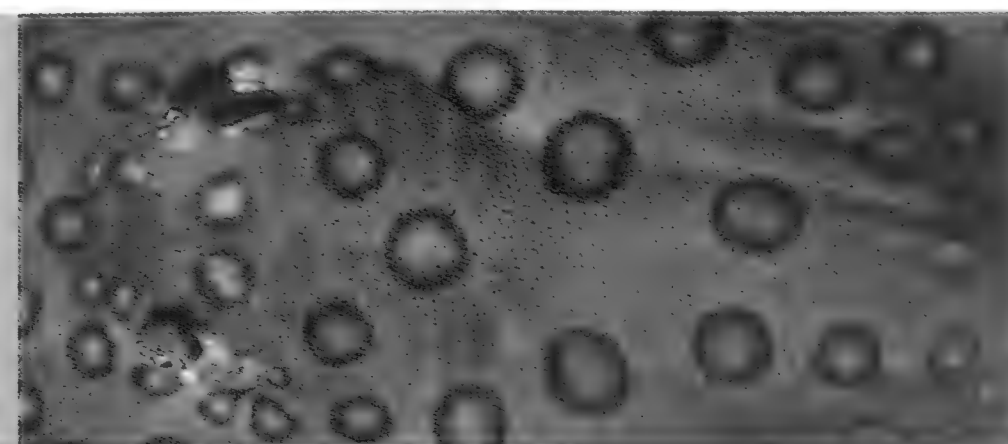
Baraka might be better matched against wild tortoises. Males generally weigh around 350 pounds; females average 265 pounds.

The tortoises' super size owes a lot to their long lives. For a century or even two, these reptiles keep living and eating and growing.

Being a behemoth has its disadvantages. Due to their mass, Aldabra tortoises are poor swimmers. And they tend to get stuck in mud. So they generally stick to dry land.

Where in the Zoo?

This animal nestles itself stealthily into river and stream beds, but if disturbed it makes its presence known. Learn more at nationalzoo.si.edu/goto/whereinthezoo.



JESSIE COHEN/NZP

HEAVYWEIGHT CHAMPIONS

Kori bustards
are the biggest
birds that can fly.

BY PAMELA BUCKLINGER

BIG BIRD » The kori bustard is a large bird native to eastern and southern Africa. It's the world's heaviest flying bird. Females weigh about 15 pounds, and males weigh 30 to 40 pounds. The largest koris are about four feet tall, or as big as an average nine-year-old kid. That's a lot of bird to get off the ground!

Because these birds are so big, they spend most of their time on the ground. Their feet are designed to help them run. But if they're threatened, koris can take off and fly away.

SPIT THAT GUM OUT! » Because they need a lot of food to maintain their big bodies, kori bustards are always on the lookout for something to eat. They're omnivores. That means they eat everything: plants, berries, eggs, insects like small grasshoppers, lizards, snakes, and even small mammals. In a pinch, they'll eat carrion (animals that are already dead).

People have even seen koris eating the gum that comes from the acacia tree. Researchers aren't sure if the birds want the gum itself or are just trying to get to the insects stuck to it.

How do they wash down their meals? Koris are among the few birds that suck up water from pools rather than scoop it up in their bills like other birds.

STRUTTING THEIR STUFF » Male kori bustards work hard for their dates. They gather in small groups and put on a display. They inflate their necks as much as four times their normal size. The birds also let out booming noises while flashing their underfeathers.

Males can have more than one mate and don't help raise the chicks. Females have no nests. Instead, a female lays her two eggs directly on the ground. The mother sits on the eggs for nearly 25 days. Once they hatch, the chicks are able to follow their mother around within a few hours. Like her, they start hunting for insects to munch on.

FAKE EGGS, REAL SUCCESS » Threatened by habitat loss, kori bustards thrive only in protected areas in Africa. Because their future is in jeopardy, the National Zoo is studying them to help increase their numbers in the wild. The Zoo is just the third institution in the United States to breed this species successfully.

One way scientists learn about these birds is by giving them artificial eggs to care for. They look like real eggs but can record the temperature and other data. The mother sits on the fake eggs, helping scientists learn more about how koris take care of their chicks. This knowledge helps us breed new koris. The National Zoo has won awards for its success in breeding kori bustards.

AT THE ZOO » Drop by the Bird House to meet the Zoo's kori bustards up close!

Happy Earth Day!

April 22 is Earth Day. Thanks to everyone who sent drawings of how you plan to celebrate. One popular theme was recycling.

Eleven-year-old **Michael Vane** plans to head into Rock Creek Park with his brother and their dog to clear trash and collect items for recycling.

Five-year-old **Kate Oliphant** plans to recycle as well. Maybe you can too!



What's your favorite part of the Zoo?
Send us a picture of it.
Please get a parent or guardian's permission before writing to us and please let us know how old you are.

Smithsonian Zoogoer
Friends of the National Zoo
P.O. Box 37012, MRC 5516
Washington, D.C. 20013-7012

FONZ RESOURCES

fonz.org

Membership
Information
202.633.2922

Special Events
202.633.4470

Development Office
202.633.3033

Camps and Classes
202.633.4470

Volunteer Services
202.633.3025

Comments? Questions?

Please email us at
member@fonz.org

Not a FONZ
member yet?
Call 202.633.3034
or go to
fonz.org/join.htm

Learn at the Zoo!

FONZ classes give children a deeper understanding of animals, their behaviors, and their habitats. Classes are open to FONZ members at the household level or higher.

Varying somewhat in structure, classes generally include hands-on activities, crafts, and time in the Zoo. Please note that classes do not include behind-the-scenes visits or direct contact between children and animals. Classes meet in the Visitor Center unless otherwise noted.



JESSIE COHEN/NZP

PRESCHOOL CLASSES

These programs invite adults and children to discover the Zoo together. All children must be accompanied by an adult. For everyone's safety and enjoyment, unregistered children and siblings may not attend—except for infants who do not yet crawl.

THE THREE BEARS

Goldilocks's tale would be a tad bit different if she had visited the National Zoo. Take a trip and visit the homes of our three bears. Join us for bear-y fun classroom activities as you learn about our giant pandas, sloth bears, and Andean bears. We're sure Goldilocks would agree that this class is just right!

AGES: 2-3
DATES: Apr. 2, 9, 16
TIME: 10-11:30 a.m.
FEE: \$25

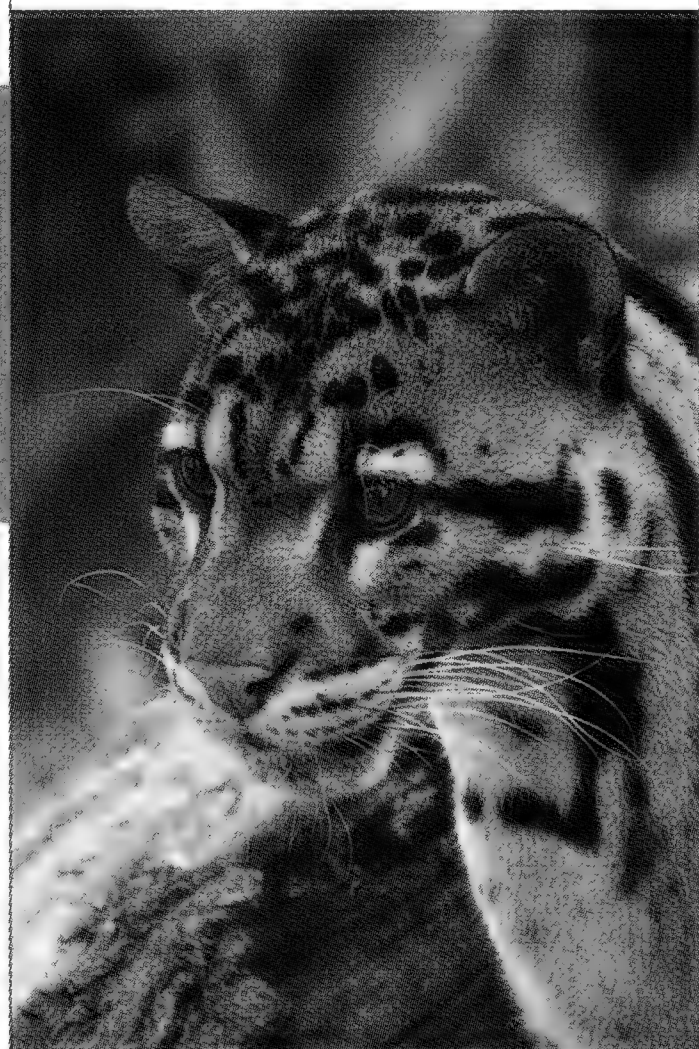
Apr. 2: Sloth Bears — Take a hike on Asia Trail to visit the sloth bears! Don't you worry; there will be nothing slow about this class.

Apr. 9: Andean Bears — Bring your favorite fuzzy friend and come learn about South America's only bear species. Meet the newest members of the Zoo's bear family, our Andean bear cubs. They're sure to be quite a spectacle!

April 16: Panda Bears — It's panda-monium! Spend the day with Mei Xiang and Tian Tian, the National Zoo's giant pandas! Make black-and-white crafts and learn about these bamboo-eating bears.

Register Online at fonz.org/classes.htm

Children's classes and programs are open to FONZ members at the household level or above. Classes meet in the Visitor Center unless otherwise noted.



JESSIE COHEN/NZP

SPLASH DANCE!

What a feeling you'll have taking this class! Dive on in as we make crafts, sing songs, and learn about our water-loving friends. Sea for yourself: You'll be dancing through the Zoo!

AGES: 2-3
DATES: Session 1: Apr. 11, 18;
May 2, 9, 16
Session 2: Apr. 12, 19;
May 3, 10, 17
Session 3: Apr. 13, 20;
May 4, 11, 18
Session 4: Apr. 14, 21;
May 5, 12, 19
Session 5: Apr. 15, 22;
May 6, 13, 20
TIME: 10-11:30 a.m.
FEE: \$125

ANIMAL FOLKTALES

Many favorite stories from around the world are about animals. Some parts are true, others imaginary. In this class, we'll read animal folktales, visit some of the animal characters on our Zoo walks, and make stick puppets so children can retell the stories at home.

AGES: 3-5
DATES: Session 1: May 5, 12, 19, 26
Session 2: May 6, 13, 20, 27
TIME: 1-2:30 p.m.
FEE: \$100



JESSIE COHEN/NZP



CHILDREN'S CLASSES

Parents are not encouraged to stay with the class, but may if they wish (for no charge).

PIRATES OF THE NATIONAL ZOO

Ahoy, matey! Arrrrre you looking for adventure? Come aboard, join the crew, and travel the imaginary seas. Explore the creatures of the deep or walk the plank.

AGES: 4-6

DATES: Apr. 3, 10, 17, 24

TIME: 10 a.m.-12 p.m.

FEE: \$28 each or
\$100 for all four.

April 3: Parrot — Every pirate needs a parrot friend, but does Polly really want a cracker? We're flocking to the Bird House to learn about our brightly feathered friends.

April 10: Crocodile — Certainly not a favorite of Captain Hook, these fascinating reptiles will make you hungry for knowledge. We'll take a bite out of our day to study crocodiles. There will be no crocodile tears, just smiles, at the end of this class!

April 17: Deep-sea Creatures — We're headed 30,000 leagues under the sea to explore the world of the octopus and its deep-sea neighbors. This class is sure to make a splash!

April 24: Treasure Hunt — Follow the map, navigate the park, and, don't forget that X marks the spot. Solve the clues to find the pirate booty and learn about Zoo's animal treasures while you're at it.



HOMESCHOOL CLASSES

Attention all home educators! Contact us at fonz_programs@si.edu if you are interested in setting up an educational program that can meet your specific needs.

FACT OR FICTION

Many of the world's folktales make astute observations of animals, with inventive explanations of how they came to look or behave the way they do. In this six-week series, we'll journey to a different continent each week to read some of the stories, and learn the facts, about the animals that live there.

AGES: 5-7

DATES: May 18, 25; June 1, 8, 15

TIME: 10:30 a.m.-12:30 p.m.

FEE: \$140



FONZ SUMMER SLEEPOVERS

**This is no ordinary
camping trip!**



Imagine waking up to the roar of powerful lions or hearing the early morning call of playful gibbons. Come spend the night at the Smithsonian's National Zoo. It's the best way to see the Zoo's animals after hours and have the park all to yourself.

Your overnight will begin with a two-hour, keeper-led tour of an exhibit area. Then later, flashlight in hand, you will hike through the Zoo and check out awesome nocturnal animals. That night, you will sleep in a tent on Lion/Tiger Hill. Your adventure will conclude the next morning with a continental breakfast and a family-friendly scavenger hunt activity.

Snore & Roar overnights take place between June and September. Online registration will begin on Tuesday, April 5 at 10 a.m.

Find a schedule and register at fonz.org/snoreandroar.htm.

FONZ MEMBERS ONLY To sign up, you must hold a current household membership or higher. Adult-only Snore & Roars are available to all membership levels. Participants in family overnights may bring two additional children as guests. A maximum of six participants may sign up per registration. Snore & Roar campers sleep in four-person tents. Participants are never asked to share their tent with strangers. Large groups cannot be accommodated.

Upgrade to a contributing membership (or higher) and register for Snore & Roar one week early. Priority registration begins online at 10 a.m. on Tuesday, March 29.

AGES Adults and children ages 6 and up. A paying adult must accompany anyone under 18, and one adult must chaperone every three children. Participants in adult-only overnights must be 21 or older.

TIME 6 p.m. to 9 a.m. the following day. A small snack is provided, but participants should eat dinner before coming to the Zoo. All Zoo restaurants close at 5 p.m.

SNORE & ROARS ARE NOT JUST FOR KIDS! Adult-only programs include wine and cheese, a two-hour, keeper-led tour, flashlight tour of the Zoo, and continental breakfast.

Tour Choices

Enjoy an exclusive, keeper-led tour of one of the following areas.

Elephant Exhibit/ Commissary

What does it take to feed a 9,000-pound elephant? Feast your eyes on the Zoo's new larger-than-life exhibit, Elephant Trails. Then meet a Zoo nutritionist and go on a behind-the-scenes tour to see where all of the diets for the Zoo's animals are designed and prepared.

FEE: \$65 per person

Great Cats No time for a cat nap! It's Snore & Roar gone carnivore—your chance to learn about lions and tigers.

FEE: \$125 per person

Bird House From cute little kiwis and terrific toucans to fabulous flamingos and cool kori bustards (the largest birds that can fly), the Bird House is home to hundreds of feathered favorites. Visit them and get a keeper's insights into the wonderful world of birds.

FEE: \$65 per person

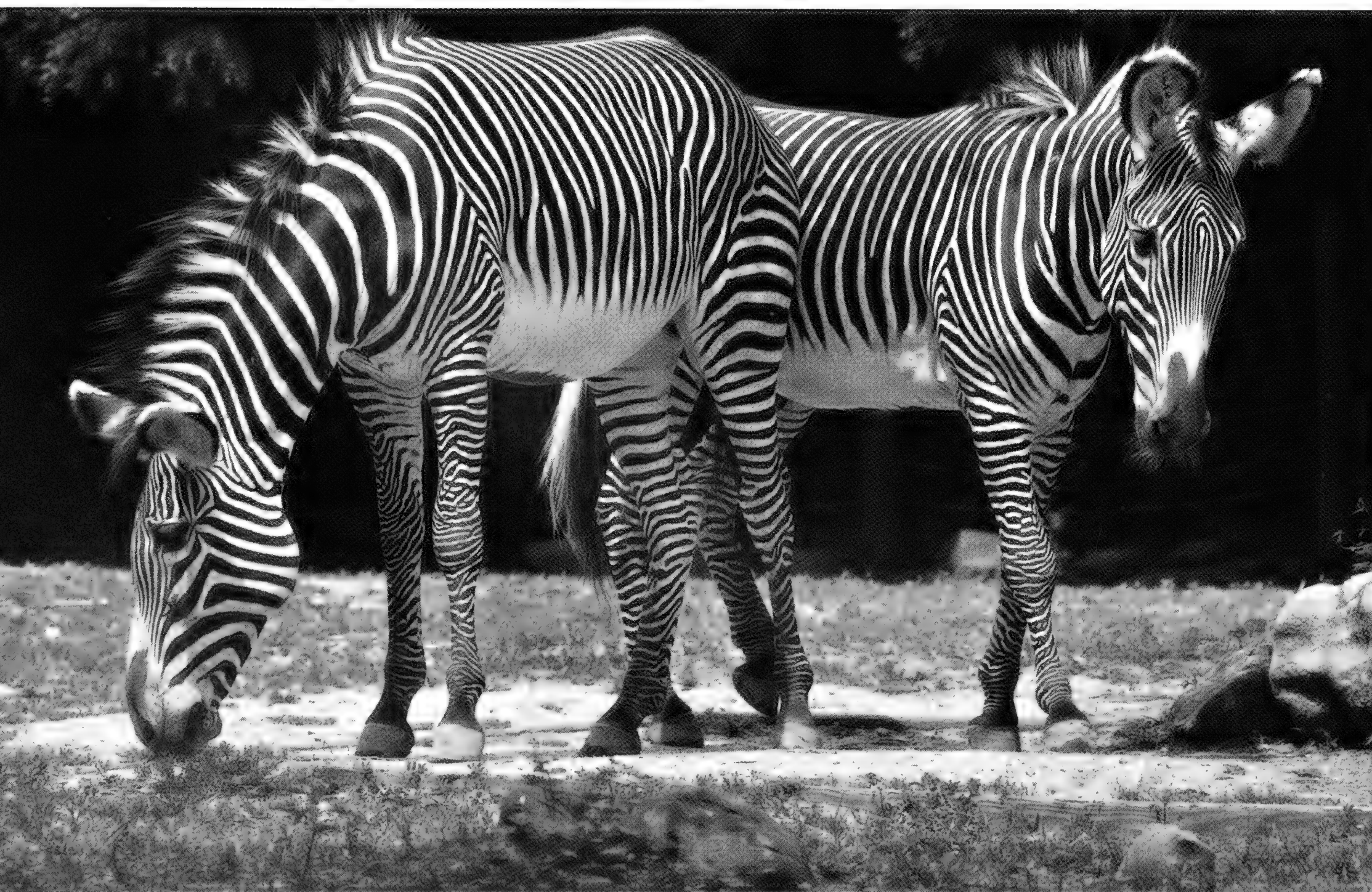
Small Mammals While you're out there roughing it, our mini-mammals will be fluffing it. See our lemurs leaping, watch our monkeys monkeying around, and peer into the underground world of naked mole-rats.

FEE: \$65 per person

Amazonia Take your family on a romp through the rainforest where you'll have an evening encounter with amphibians, fish, freshwater rays, birds and free-ranging monkeys.

FEE: \$65 per person

CANCELLATION POLICY: To receive a 75-percent refund, you must provide written notification via email or regular mail at least four weeks before your Snore & Roar date. No refunds or changes will be made thereafter. Snore & Roar overnights go on rain or shine.



MEHGAN MURPHY/NZP

FONZ SUMMER SLEEPOVERS

Giant Pandas/Great Apes

Wake up with your primate cousins in the Ape House and come to the bamboo buffet breakfast with the giant pandas. These National Zoo celebrities are a grand way to start your day. Note: This tour takes place in the morning.

FEE: \$125 per person

Asia Trail A true after-hours hot spot in the center of D.C., our Asia Trail is a hub of activity at night, with sloth bears, clouded leopards, fishing cats, Asian small-clawed otters, and red pandas. Please note: Giant pandas are not part of the tour.

FEE: \$125 per person

Cheetah Conservation Station

Chase a cheetah before catching some Z's. Learn about some of their neighbors at the Zoo, including dama gazelles, scimitar-horned oryx, maned wolves, and Grevy's zebras.

FEE: \$125 per person

Invetebrates Being spineless can be cool. In fact, most animals lack backbones. Learn about the giant Pacific octopus, corals, golden orb spiders, and other incredible invertebrates.

FEE: \$65 per person

Reptile Discovery Center

Get the rap on reptiles and amphibians, from giant anacondas to tiny Panamanian golden frogs, extinct in the wild.

FEE: \$65 per person



MEGHAN MURPHY/NZP

Conservation Campouts

Take in the beauty of the Shenandoah Mountains while enjoying a rare glimpse of the Smithsonian Conservation Biology Institute's headquarters in Front Royal, Virginia.

Your adventure begins with a keeper-led tour and continues with a campfire. Bunk in tents provided by FONZ, then rise for breakfast and a family-friendly activity.

Learn more and register at fonz.org/conservationcampout.htm.

AGES: Six and older. Each group must include one adult for each three children. These are all family overnights.

TIME: 5 p.m. to 10 a.m. the following day. A small evening snack is provided, but participants should dine before arriving. You can find many restaurants within a few miles of the site.

FEE: Members: \$115 per person. Nonmembers: \$125 per person.



Scout Snooze

When it comes to camping with exotic animals, nothing beats the Smithsonian's National Zoo. Your troop's overnight will include wildlife-related activities and a flashlight tour of the nocturnal residents at the Zoo.

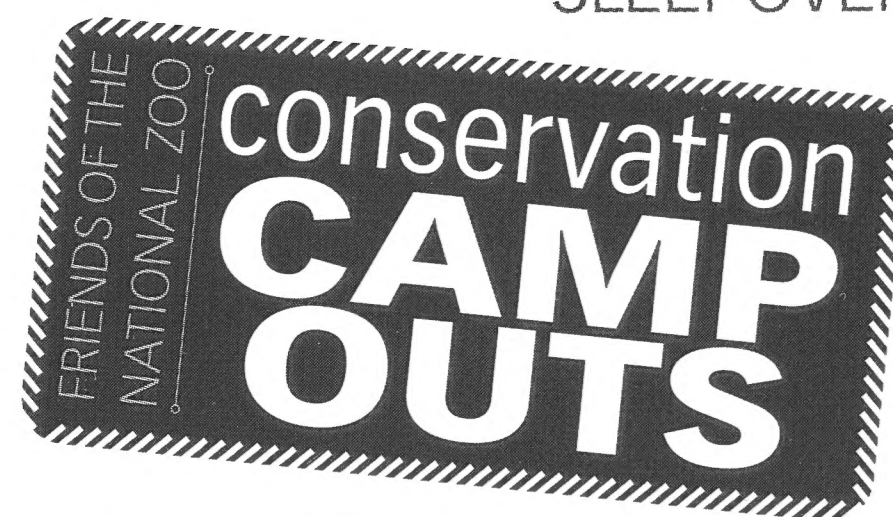
Scout Snooze campers sleep on Lion/Tiger Hill in four-person tents provided by FONZ. In the morning, an animal keeper leads campers on a two-hour tour of an exhibit area. An evening snack and continental breakfast are provided.

Scout Snooze sleepovers are available only to FONZ members. To sign up, one adult per scout group must have a FONZ Household membership (or higher). Scout leaders may assign tent arrangements.

AGES: Children ages 6 and older. A paying adult must accompany all participants under 18, and one adult is required to chaperone every three children.

TIME: 6 p.m. to 9:30 a.m. the following day. A small snack is provided, but participants should eat dinner before coming to the Zoo. All Zoo restaurants close at 5 p.m.

FEE: \$650 for up to ten people (including adults), \$65 for each individual above ten and up to twenty participants.



Tour Themes

A keeper will lead your group on one of the following tours.

- Careers in Conservation
- Wildlife Detectives
- The Scoop on Poop
- Horsing Around
- Feathered Friends



MEGHAN MURPHY/NZP

Scout Snooze Programs

Each overnight includes a tour of one or two of the following areas. Visit fonz.org/scoutsnooze.htm to learn more.

- Invertebrates
- Bird House
- Small Mammals
- Reptile Discovery Center
- Amazonia



MEHGAN MURPHY/NZP

Look Who's Up!

Wandering into the Small Mammal House

during Boo at the Zoo, photographer Mehgan Murphy spotted something many zoogoers miss: a wide-awake sloth. Having her camera ever ready gave Murphy the chance to capture a rare shot of this nocturnal animal.

Technical Notes — CAMERA: Canon EOS-1D Mark III;
EXPOSURE: 1/60 second at f/6.3; LENS: Canon 24-105mm

Smithsonian Zoogoer welcomes FONZ members' submissions of photos taken at the Zoo. Please send photos to **Zoogoer@si.edu**. We will contact you if we are able to use your picture for the Zoo View page.

THE FUNDRAISER YOU CAN REALLY SINK YOUR TEETH INTO



Don't miss ZooFari at the Smithsonian's National Zoo on May 19.

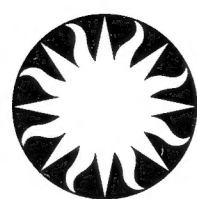
Indulge in great food from over 100 DC-area restaurants and vintners all while supporting conservation programs at the National Zoo. Join us for ZooFari, an extravaganza of food and wine, and help take a bite out of conservation. Find out more at fonz.org/zoofari.htm.

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Friends of the National Zoo, PO Box 37012, MRC 5516, NW, Washington, DC 20013-7012, www.fonz.org



Smithsonian
National Zoological Park



Easter Monday at the National Zoo circa 1960

Old-fashioned good time. New family tradition.

A Washington area tradition for more than 100 years, the National Zoo's Easter Monday: An African American Family Tradition is a celebration not to be missed. Visitors will enjoy special family activities, entertainment, popular games and animal demonstrations. Admission is free, so join us for the festivities from 10 to 4 on April, 25, 2011 and start a tradition of your own. Find out more at fonz.org/easter. Sponsored by: Booz Allen Hamilton, Capital One Bank, United Airlines, WHUR Radio, and Yellowbook.

